
Selected Scientific Publications on Breast Tomosynthesis

2014

(P) Bernardi D, Caumo F, Macaskill P, Ciatto S, Pellegrini M, Brunelli S, Tuttobene P, Bricolo P, Fantò C, Valentini M, Montemezzi S, Houssami N. Effect of integrating 3D-mammography (digital breast tomosynthesis) with 2D-mammography on radiologists' true-positive and false-positive detection in a population breast screening trial. *Eur J Cancer*. 2014 May;50(7):1232-8.

* Key Point: Variability in performance among radiologists using 2D mammography was also reflected in variability with the addition of 3D mammography, however there was less variability in true positive reads using 3D mammography. The authors conclude that the addition of tomosynthesis to 2D conventional mammography either reduced the false positive rate or improved the cancer detection rate, with most readers achieving both improvements.

(P) Destounis S, Arieno A, Morgan R. Initial experience with combination digital breast tomosynthesis plus full field digital mammography or full field digital mammography alone in the screening environment. *J Clin Imaging Sci*. 2014 Feb 25;4:9.

Key Point: The authors conclude that the addition of breast tomosynthesis to digital mammography significantly reduced the recall rate by ~63%.

(P) Friedewald S M, Rafferty E A, Rose S L, , Durand M A, Plecha D M, Greenberg J S, Hayes M K, Copit D S, Carlson K L, Cink T M, Barke L D, Greer L N, Miller D P, Conant E F. Breast Cancer Screening Using Tomosynthesis in Combination With Digital Mammography. *JAMA*. 2014;311(24):2499-2507. doi:10.1001/jama.2014.6095.

* Key Point: The authors conclude that the addition of 3D mammography to 2D mammography demonstrated an increase in cancer detection rate and a decrease in the recall rate.

(P) Greenberg J S, Javitt M C, Katzen J, Michael S, Holland A E. Clinical Performance Metrics of 3D Digital Breast Tomosynthesis Compared With 2D Digital Mammography for Breast Cancer Screening in Community Practice. *AJR*;203, September 2014.

Key Point: The authors concluded that patients screened with combined 2D/3D digital breast tomosynthesis resulted in increases in cancer detection rate (for cancer overall and for invasive cancers) and also resulted in decreases in the recall rate. The results also demonstrated a significantly higher positive predictive value for recalls.

(P) Houssami N, Macaskill P, Bernardi D, Caumo F, Pellegrini M, Brunelli S, Tuttobene P, Bricolo P, Fantò C, Valentini M, Ciatto S. Breast screening using 2D-mammography or integrating digital breast tomosynthesis (3D-mammography) for single-reading or double-reading - Evidence to guide future screening strategies. *Eur J Cancer*. 2014 Jul;50(10):1799-807.

* Key Point: Combined 2D/3D-mammography was found to offer significantly higher cancer detection than 2D mammography using either single or double reading.

(P) Partyka L, Lourenco AP, Mainiero MB. Detection of mammographically occult architectural distortion on digital breast tomosynthesis screening: initial clinical experience. *AJR Am J Roentgenol*. 2014 Jul;203(1):216-22. doi: 10.2214/AJR.13.11047.

Key Point: Breast tomosynthesis can visualize architectural distortions (ADs) better than digital mammography (DM), and also can detect ADs that are hidden on DM, thus increasing the cancer detection rate.

(P) Rafferty EA, Park JM, Philpotts LE, Poplack SP, Sumkin JH, Halpern EF, Niklason LT. Diagnostic accuracy and recall rates for digital mammography and digital mammography combined with one-view and two-view tomosynthesis: results of an enriched reader study. *AJR Am J Roentgenol*. 2014 Feb;202(2):273-81. doi: 10.2214/AJR.13.11240.

* Key Point: The authors conclude that the addition of one-view tomosynthesis to digital mammography improved the diagnostic accuracy and reduced the recall rate. However, the addition of two-view tomosynthesis to digital mammography resulted in twice the diagnostic performance gain at the same time further reducing the recall rate.

(P) Skaane P, Bandos AI, Eben EB, Jepsen IN, Krager M, Haakenaasen U, Ekseth U, Izadi M, Hofvind S, Gullien R. Two-view digital breast tomosynthesis screening with synthetically reconstructed projection images: comparison with digital breast tomosynthesis with full-field digital mammographic images. *Radiology*. 2014 Jun;271(3):655-63.

* Key Point: The authors conclude that the use of generated 2D images constituted an average dose reduction of 45% while not resulting in any clinically meaningful differences in diagnostic accuracy

(P) Zuley ML, Guo B, Catullo VJ, Chough DM, Kelly AE, Lu AH, Rathfon GY, Lee Spangler M, Sumkin JH, Wallace LP, Bandos AI. Comparison of Two-dimensional Synthesized Mammograms versus Original Digital Mammograms Alone and in Combination with Tomosynthesis Images. *Radiology*. 2014 Jun;271(3):664-71.

* Key Point: The authors conclude that the use of synthetic mammogram whether alone or in combination with tomosynthesis has similar diagnostic accuracy and may eliminate the need for FFDM in a routine clinical study. The authors also conclude that the use of synthetic mammogram reduces the radiation dose in patients that are undergoing tomosynthesis-based screening mammography.

2013

(AB) Beck N, Butler R, Durand M, Andrejeva L, Hooley R, Horvath L, Raghu M, Philpotts L. One-View Versus Two-View Tomosynthesis: A Comparison of Breast Cancer Visibility in the Mediolateral Oblique and Cranio-caudal Views. Presented at the ARRS 2013, Scientific Session 27 - Breast Imaging.

* Key Point: The study results demonstrated that obtaining both views is necessary to ensure that a cancer will be optimally visualized and derive the greatest potential benefit from tomosynthesis.



(P) Brandt KR, Craig DA, Hoskins TL, Henrichsen TL, Bendel EC, Brandt SR, Mandrekar J. Can digital breast tomosynthesis replace conventional diagnostic mammography views for screening recalls without calcifications? A comparison study in a simulated clinical setting. AJR Am J Roentgenol. 2013 Feb;200(2):291-8. doi: 10.2214/AJR.12.8881.

** Key Point: The authors conclude that DBT offers similar sensitivity and specificity compared to conventional digital mammography for the evaluation of noncalcified findings recalled from screening mammography. The authors also concluded that for more than 90% of the findings, two-view DBT was sufficient for further mammographic evaluation, and can replace conventional diagnostic mammography.*

(AB) Butler R, Marx S, Durand M, Hooley R, Horvath L, Raghu M, Andrejeva L, Philpotts L. Suspicious Breast Lesions Visible on Tomosynthesis and Occult on 2D Mammography: Imaging Features and Histology. Presented at the ARRS 2013, Scientific Session 27 - Breast Imaging.

** Key Point: Tomosynthesis finds lesions occult on 2D mammography from screening, in diagnostic workup, or evaluation of palpable masses. Tomosynthesis can also be used for preoperative localization for obtaining a histologic diagnosis.*

(AB) Butler R, Ostrover R, Hooley R, Geisel J, Raghu M, Philpotts L. Tomosynthesis in Breast Cancer Visualization as a Function of Mammographic Density. Presented at RSNA 2013, SSE02-04 Breast Imaging (Digital Breast Tomosynthesis Lesions).



** Key Point: ~70% non-calcified breast cancers are visualized only or better on tomosynthesis imaging in women with scattered and heterogeneously dense breasts. Cancers are visualized equally well on tomosynthesis and 2D mammography in women with fatty and extremely dense breasts.*

(P) Chiarelli AM, Edwards SA, Prummel MV, Muradali D, Majpruz V, Done SJ, Brown P, Shumak RS, Yaffe MJ. Digital compared with screen-film mammography: performance measures in concurrent cohorts within an organized breast screening program. Radiology. 2013 Sep;268(3):684-93. doi: 10.1148/radiol.13122567. Epub 2013 May 14.

** Key Point: Although DR is equivalent to SFM for breast screening among women aged 50-74 years, the cancer detection rate was significantly lower for CR making CR 21% less effective among all screening examinations. Screening programs should monitor the performance of CR separately and may consider informing women of the potentially lower cancer detection rates.*

(AB) Conant E, Wan F, Thomas M, Synnestevedt M, Weinstein S, Roth S, Kontos D, McCarthy A, Mitra N. Implementing Digital Breast Tomosynthesis (DBT) in a Screening Population: PPV1 as a Measure of Outcome. Presented at RSNA 2013, SSK01-02 Breast Imaging (Digital Breast Tomosynthesis Screening Outcomes).

** Key Point: This large screening study results demonstrated that the addition of tomosynthesis resulted in reduction in recall rate with an increase in cancer detection rates. The authors further conclude that in this large prospective population, the screening outcomes significantly improved for 5 of 6 readers as measured by PPV1 and remained stable for 1 reader.*

(P) Ciatto S, Houssami N, Bernardi D, Caumo F, Pellegrini M, Brunelli S, Tuttobene P, Bricolo P, Fantò C, Valentini M, Montemezzi S, Macaskill P. Integration of 3D digital mammography with tomosynthesis for population breast-cancer screening (STORM): a prospective comparison study. Lancet Oncol. 2013 Jun;14(7):583-9. doi: 10.1016/S1470-2045(13)70134-7. Epub 2013 Apr 25.  

** Key Point: The study results demonstrated that combined 2D/3D mammography improves the cancer detection by 51% and also reduces the false-positive recall rates by 17%.*

(AB) Dang P, Humphrey K, Freer P, Halpern E, Saksena M, Rafferty E. Comparison of Lesion Detection and Characterization in Invasive Cancers Using Breast Tomosynthesis versus Conventional Mammography. Presented at RSNA 2013, SSE02-03 Breast Imaging (Digital Breast Tomosynthesis Lesions).

** Key Point: The authors conclude that cancers presenting with architectural distortion were detected significantly better with tomosynthesis as compared to digital mammography. Similar effect was observed in characterizing cancer morphology.*

(AB) Fajardo L, Limin Yang L, Park J. Imaging and Histopathology Findings of Breast Lesions Detected by Tomosynthesis. Presented at RSNA 2013, SSK01-08 Breast Imaging (Digital Breast Tomosynthesis Screening Outcomes).

** Key Point: The authors conclude that 30% more cancers are detected by the addition of tomosynthesis to FFDM in their screening program. They also conclude that biopsy PPV3 improved with the addition of tomosynthesis to their practice.*

(AB) Geisel J, Raghu M, Durand M, Haas B, Lapia K, Hooley R, Butler R, Philpotts L. Cancer Detection Rates on Screening 2D Versus Combined 2D and Tomosynthesis Imaging. Presented at the ARRS 2013, Scientific Session 27 - Breast Imaging.

** Key Point: The study concludes that the cancer detection rate increased by 12% after the addition of breast tomosynthesis to digital mammography.*

(P) Haas BM, Kalra V, Geisel J, Raghu M, Durand M, Philpotts LE. Comparison of tomosynthesis plus digital mammography and digital mammography alone for breast cancer screening. Radiology. 2013 Dec;269(3):694-700. doi: 10.1148/radiol.13130307. Epub 2013 Oct 28.

** Key Point: The study results demonstrated a significant reduction in recall rates (~30%, the greatest reductions seen for women younger than 50 years old and in women with dense breasts) along with an increase in the cancer detection rate (9.5% overall) after the introduction of tomosynthesis in the clinical practice.*

(AB) Iqbal A, Michell M, Wasan R, Douiri A, Evans D, Peacock C, Morel J. Measurement of Invasive Breast Cancer Using Digital Breast Tomosynthesis, Full Field Digital Mammography and Ultrasonography. Presented at RSNA 2013, LL-BRS-SU1A Breast - Sunday Posters and Exhibits.

** Key Point: The study results show that digital breast tomosynthesis has a higher diagnostic accuracy of breast cancers compared to FFDM and Ultrasound, especially for parenchymal distortion and asymmetric density.*

(AB) Kalra V, Haas B, Philpotts L. Cost-Effectiveness of Tomosynthesis in Screening Mammography: Analysis by Breast Density and Patient Age. Presented at RSNA 2013, LL-BRS-WE7B Breast - Wednesday Posters and Exhibits.

** Key Point: The authors conclude that screening with tomosynthesis demonstrate greater cost-effectiveness especially in younger women and women with dense breasts. The overall cost reduction of unnecessary diagnostic workups was ~17%.*

(AB) Mariscotti G, Durando M, Martincich L, Caramia E, Campanino P, Luparia A, Bergamasco L, Fonio P, Gandini G. . Comparative Study with Digital Mammography (DM) vs. DM Combined with Digital Breast Tomosynthesis (DBT) for the Detection of Invasive Lobular Carcinoma (ILC). Presented at RSNA 2013, SSE02-02 Breast Imaging (Digital Breast Tomosynthesis Lesions).

** Key Point: The study results demonstrated an increase in the sensitivity and diagnostic accuracy in the detection of ILC using digital breast tomosynthesis. The effect was more pronounced in women with dense breasts.*

(AB) Martinez Miravete P, Etxano J, Slon P, Garcia P, Millor M, Pina L.. Features of Additional Breast Cancers Detected by Digital Breast Tomosynthesis after Normal Digital Mammography. Presented at RSNA 2013, VSB31-09 Breast Series: Emerging Technologies in Breast Imaging.

* Key Point: The additional breast cancers detected by DBT show different radiological presentation and histology than breast cancers detected with DM, most commonly architectural distortions and tubular breast cancers.

(AB) P. Martínez, J. Echano, M. Sainz, I. Simon, G. Viteri, A. Garcia Lallana, C. Minguillon, L. Pina. The role of additional tomosynthesis combined with digital mammography. Presented at ECR 2013, B-0809, SS 1702 Tomosynthesis: a role in clinical practice?

* Key Point: The study concludes that the addition of DBT to conventional 2D screening mammography increases the cancer detection rate by 61%.

(AB) Philpotts L, Kalra V, Crenshaw J, Butler R. How Tomosynthesis Optimizes Patient Work Up, Throughput, and Resource Utilization. Presented at RSNA 2013, SSK01-09 Breast Imaging (Digital Breast Tomosynthesis Screening Outcomes).

* Key Point: The authors conclude that the addition of tomosynthesis resulted in lesser number of images per diagnostic case that resulted in the faster patient diagnostic workup and so better patient throughput and resource utilization.

(P) Rafferty EA, Park JM, Philpotts LE, Poplack SP, Sumkin JH, Halpern EF, Niklason LT. Assessing radiologist performance using combined digital mammography and breast tomosynthesis compared with digital mammography alone: results of a multicenter, multireader trial. *Radiology*. 2013 Jan;266(1):104-13. doi: 10.1148/radiol.12120674.



* Key Point: Radiologist performance for diagnostic accuracy and recall rate significantly improved for with the addition of tomosynthesis to digital mammography.

(AB) Raghu M, Hooley R, Philpotts L, Geisel J, Durand M, Andrejeva-Wright L, Horvath L, Butler R. Digital Breast Tomosynthesis in Diagnostic Mammography: Can Tomo Affect the Final Assessment Categories? Presented at RSNA 2013, SSE02-06 Breast Imaging (Digital Breast Tomosynthesis Lesions).

* Key Point: The authors conclude that the number of patients categorized as BI-RAD3 needing follow-up will be reduced with the use of tomosynthesis in diagnostic mammography.

(P) Rose SL, Tidwell AL, Bujnoch LJ, Kushwaha AC, Nordmann AS, Sexton R Jr. Implementation of breast tomosynthesis in a routine screening practice: an observational study. *AJR Am J Roentgenol*. 2013 Jun;200(6):1401-8. doi: 10.2214/AJR.12.9672.

* Key Point: The study results demonstrated a significant reduction in recall rates (-37%) along with an increase in the cancer detection rate (35% overall, 54% for invasive cancers) after the introduction of tomosynthesis in the clinical practice.

(P) Skaane P, Bandos AI, Gullien R, Eben EB, Ekseth U, Haakenaasen U, Izadi M, Jebsen IN, Jahr G, Krager M, Hofvind S. Prospective trial comparing full-field digital mammography (FFDM) versus combined FFDM and tomosynthesis in a population-based screening programme using independent double reading with arbitration. *Eur Radiol*. 2013 Aug;23(8):2061-71. doi: 10.1007/s00330-013-2820-3. Epub 2013 Apr 4.  

* Key Point: The study results demonstrated that double reading improved cancer detection rate by 30% and decreased the false-positive rate by 18% during mammographic screening.

(P) Skaane P, Bandos AI, Gullien R, Eben EB, Ekseth U, Haakenaasen U, Izadi M, Jebsen IN, Jahr G, Krager M, Niklason LT, Hofvind S, Gur D. Comparison of digital mammography alone and digital mammography plus tomosynthesis in a population-based screening program. *Radiology*. 2013 Apr;267(1):47-56. doi: 10.1148/radiol.12121373. Epub 2013 Jan 7.

* Key Point: In a screening study involving over 12,000 women, the addition of tomosynthesis to digital mammography resulted in a 40% increase in the cancer detection rate for invasive cancers, and a simultaneous significant decrease in false-positive rate. The increase was observed across all breast densities.



(AB) Skaane P, Eben E, Jebsen I, Haakenaasen U, Krager M, Izadi M, Jahr G, Ekseth U. Trends in Time to Interpretation of Tomosynthesis Based Screening Examinations with Increasing Experience. Presented at RSNA 2013, SSK01-04 Breast Imaging (Digital Breast Tomosynthesis Screening Outcomes).

* Key Point: The authors conclude that addition of tomosynthesis increases the interpretation time, but that the time is acceptable for high-volume screening. This time decreases with increasing experience, increasing the interpretation time by approximately 40% compared to FFDM.



(P) Zuley ML, Bandos AI, Ganott MA, Sumkin JH, Kelly AE, Catullo VJ, Rathfon GY, Lu AH, Gur D. Digital breast tomosynthesis versus supplemental diagnostic mammographic views for evaluation of noncalcified breast lesions. *Radiology*. 2013 Jan;266(1):89-95. doi: 10.1148/radiol.12120552. Epub 2012 Nov 9.

* Key Point: Tomosynthesis significantly improved diagnostic accuracy for non-calcified lesions compared to supplemental mammographic views.



2012

(P) Bernardi D, Ciatto S, Pellegrini M, Anesi V, Burlon S, Cauli E, Depaoli M, Larentis L, Malesani V, Targa L, Baldo P, Houssami N. Application of breast tomosynthesis in screening: incremental effect on mammography acquisition and reading time. *Br J Radiol*. 2012 Dec;85(1020):e1174-8. doi: 10.1259/bjr/19385909.  

* Key Point: At initial implementation, acquisition time and the reading time increased with the addition of tomosynthesis to digital mammography, and this was associated with the increase in screening accuracy.


(P) Bernardi D, Ciatto S, Pellegrini M, Tuttobene P, Fanto' C, Valentini M, Michele SD, Peterlongo P, Houssami N. Prospective study of breast Tomosynthesis as a triage to assessment in screening. *Breast Cancer Res Treat*. 2012 Jan 22. [Epub ahead of print] PubMed PMID: 22270938.  

* Key Point: Tomosynthesis demonstrates its capability to improve breast screening specificity and to reduce recall rates.



(AB) Belair J, Zuley M, Ganott M, Kelly A, Shinde D, Shah R, Catullo V, Mishra M, Gur D. Non-contrast Cone-Beam CT s Tomosynthesis: Identification and Classification of Benign and Malignant Breast Lesions. Presented at RSNA 2012, SSM01-05 Breast Imaging (Computer-aided Detection and Other topics).  

* Key Point: Tomosynthesis is superior to non-contrast CBCT for the identification and classification of non-calcified breast lesions, both malignant and benign. Additionally, readers were more confident characterizing lesions using tomosynthesis compared to CBCT.





(AB) Brandt K, Craig D, Henrichsen T, Bendel E, Brandt S. Tomosynthesis Compared to Diagnostic Mammography When Evaluating Abnormalities Identified at Screening Mammography. Presented at the ARRS 2012, Breast Imaging. 



* Key Point: Tomosynthesis had excellent agreement with digital mammography in the evaluation of abnormalities, without calcifications, identified at screening mammography, and showed the potential for a reduction in the number of required x-rays.

(AB) Butler R, Hui A, Chen C, Durand M, Philpotts L. Effect of Digital Breast Tomosynthesis Screening on Diagnostic Work-up Patterns. Presented at RSNA 2012, VSBR41-09 Breast Series: Emerging Technologies in Breast Imaging.  



* Key Point: Screening with DBT may offer an opportunity to reduce cost, lower radiation dose, and improve workflow in the diagnostic breast imaging environment.

(AB) Conant E, Gavenonis S, Weinstein S, Schnall M, Kontos D. Early Implementation of Digital Breast Tomosynthesis: Comparison of Call-back and Cancer Detection Rates in a Clinical Screening Practice. Presented at RSNA 2012, LL-BRS-MO8B Breast Imaging Lunch Hour CME Posters.  



* Key Point: Digital breast tomosynthesis may offer improvements in sensitivity and specificity however, larger prospective studies are warranted to improve power and generalizability of the possible benefits.

(AB) Destounis S, Murphy P, Seifert P, Somerville P, Paulis L, Cavanaugh D, Arieno A, Morgan R. Experience with Combination 2D/3D Breast Tomosynthesis vs FFDM in the Screening Environment. Presented at RSNA 2012, LL-BRS-MO3C Breast Imaging Afternoon CME Posters.  



* Key Point: The 2D/3D breast tomosynthesis group showed significantly lower recall rates despite increased risk factors compared to the FFDM group, with additional cancers found.

(AB) Durand M, Chen C, Butler R, Philpotts L. Comparability of Digital Breast Tomosynthesis with Conventional Mammography, Ultrasonography and MRI for Tumor Measurement. Presented at RSNA 2012, LL-BRS-WE4D Breast Imaging Afternoon CME Posters.  


* Key Point: DBT allows for more accurate tumor measurement compared to 2D. In addition, DBT measurement including tumor spicules more closely reflects final pathology measurements than measurement without tumor spicules.

(AB) ElMaadawy M, Seely J, Doherty G, Lad S. Digital Breast Tomosynthesis in the Evaluation of Focal Mammographic Asymmetry, Do You Still Need Coned Compression Views? Presented at RSNA 2012, SSE02-05 Breast Imaging (Digital Breast Tomosynthesis).  



* Key Point: In evaluating focal mammographic asymmetry, DBT had a better diagnostic performance than CC in terms of lesion visibility, nature and morphologic assessment. DBT also significantly increased the reader's confidence with less need to proceed to US

(AB) Freer P, Niell B, Raferty E. Digital Breast Tomosynthesis-Guided Needle Localization with Surgical Excision of Tomosynthesis Detected, Mammographically and Sonographically Occult Areas of Architectural Distortion. Presented at RSNA 2012, SST01-01 Breast Imaging (Interventional Techniques and Radiology/Pathology Correlation).  



* Key Point: With experience, tomosynthesis-guided needle localization is a feasible and accurate method for histologic sampling of suspicious areas of tomosynthesis detected, mammographically and sonographically occult architectural distortion.

(AB) Henrichsen T, Bendel E, Craig D, Brandt K, Brandt S. Can Tomosynthesis Replace Diagnostic Mammography in the Workup of Masses, Areas of Distortion, and Asymmetries Identified at Screening Mammography? Presented at the ARRS 2012, Scientific Session 22 - Breast Imaging: Screening/Emerging Technologies. 



* Key Point: Tomosynthesis had excellent agreement with digital mammography in the evaluation of abnormalities, without calcifications, identified at screening mammography. The authors also suggest considering tomosynthesis in the diagnostic setting.

(AB) Iqbal A, Michell M, Wasan R, Douiri A, Evans D, Peacock C, Morel J. Digital Breast Tomosynthesis influences the change in mammographic signs of breast lesions. Poster presented at Symposium Mammographicum Conference 2012, 4.3(1) Challenges of Diagnosis.  



* Key Point: The authors conclude that tomosynthesis provides additional information compared to FFDM that allows the radiologist to classify the mammographic features and probabilities of malignancies more accurately.

(AB) Kalra V, Haas B, Butler R, Geisel J, Hooley R, Andrejeva L, Raghu M, Horvath L, Philpotts L. Time for Tomosynthesis: Screening Combined Digital Breast Tomosynthesis vs. Full-Field Digital Mammography Interpretation Time in Clinical Practice: A Prospective Study of 300 Cases. Presented at RSNA 2012, VSBR41-11 Breast Series: Emerging Technologies in Breast Imaging.  



* Key Point: Combined DBT and FFDM compared to FFDM resulted in near doubling of the interpretation time for all breast densities with the exception of extremely dense.

(AB) Kalra V, Haas B, Forman H, Philpotts L. Cost-Effectiveness of Digital Breast Tomosynthesis. Presented at RSNA 2012, LL-BRS-WE5C Breast Imaging Afternoon CME Posters.  



* Key Point: Combined DBT had a direct cost savings of \$10,185 per 1,000 women screened resulting from decreased callback rates. Given that there also appears to be a trend for improved cancer detection rate, combined DBT appears to be preferable to FFDM alone for screening mammography.

(AB) Martinez P, Sainz M, Garcia-Lallana A, Minguillon C, Simon I, Viteri G, Pina L. The Role of Additional Digital Tomosynthesis Combined with Digital Mammography. Presented at RSNA 2012, SSE02-02 Breast Imaging (Digital Breast Tomosynthesis).  



* Key Point: Results show that adding Tomosynthesis increases the detection rate per 1000 from 1.5% to 2.33% - an increase of 55% and there are not significant differences among the three ACR density patterns 2, 3 and 4.

(AB) Martínez P, Garcia Lallana A, Sainz Mendiguren R, Minguillon C, Pina L. The role of breast tomosynthesis combined with digital mammography. Presented at ECR 2012, SS 602 Tomosynthesis and FFDM.  



* Key Point: Tomosynthesis increases cancer detection rate not just in dense breasts but also in BI-RADS density 2 breasts.

(P) Michell MJ, Iqbal A, Wasan RK, Evans DR, Peacock C, Lawinski CP, Douiri A, Wilson R, Whelehan P. A comparison of the accuracy of film-screen mammography, full-field digital mammography, and digital breast tomosynthesis. Clin Radiol. 2012 May 23. [Epub ahead of print] PubMed PMID: 22625656.  



* Key Point: The addition of tomosynthesis improved the diagnostic accuracy in the assessment of screen detected soft tissue lesions compared to full-field digital mammography and film-screen mammography combined and film-screen mammography alone.

(AB) Philpotts L.; Raghu M.; Durand M.; Hooley R.; Vashi R.; Horvath L.; Geisel J.; Butler R. **Initial Experience With Digital Breast Tomosynthesis in Screening Mammography.** Presented at the ARRS 2012, Scientific Session 22 - Breast Imaging: Screening/Emerging Technologies.  

* Key Point: Tomosynthesis reduces the recall rate by more than 40% when combined with 2D mammography than 2D mammography alone.

(AB) Poplack S, Frazee T, Zhongze L, Elizabeth D, Tosteson T. **A Comparison of Digital Breast Tomosynthesis versus Contrast Enhanced Magnetic Resonance Imaging in the Preoperative Assessment of Breast Cancer.** Presented at RSNA 2012, SSM02-01 Breast Imaging (MRI and Digital Mammography Topics).  



* Key Point: CEMRI is more accurate in determining local disease extent than DBT. On average CEMRI detects 3x as many additional lesions as DBT. A similar proportion of the additional lesions detected by each modality reflects atypical or malignant histology and results in a similar proportional change in management. DBT is more acceptable to patients than CEMRI.

(AB) Raghavan B, Rajmohan M, Sivaramalingam G. **Role of breast tomosynthesis in the morphological analysis of breast lesions.** Presented at ECR 2012, SS 602 Tomosynthesis and FFDM.  



* Key Point: Tomosynthesis correlated more accurately than 2D digital mammograms with BIRADS categorization from histopathological examinations; tomosynthesis also useful for morphological analysis of breast lesions.

(AB) Raghavan B, Selvakumar D. **Role of Tomosynthesis in assessing the size of the breast lesion.** Presented at ECR 2012, C-1045 Scientific exhibit.

* Key Point: This is a preliminary study that shows 3D mammography to be as reliable as 2D in predicting tumor size especially in stellate lesions and dense breast parenchyma, if it is measurable.

(AB) Rose S, Ice M, Nordmann A, Sexton R, Song R. **A Comparison of Recall Rates between Full Field Digital Mammography (FFDM) and Full Field Digital Mammography Plus Tomosynthesis in a Community Setting.** Presented at RSNA 2012, SSE02-01 Breast Imaging (Digital Breast Tomosynthesis).  



* Key Point: Adding tomosynthesis to FFDM reduced recall rates in a routine screening population by approximately 35%.

(AB) Rose S, Bujnoch L, O'Toole M, Nordmann A, Sexton R, Willison K, Tidwell A. **Breast Tomosynthesis and Digital Mammography for Breast Cancer Screening: Medical Outcomes Audit.** Presented at RSNA 2012, VSBR41-06 Breast Series: Emerging Technologies in Breast Imaging.  



* Key Point: These preliminary results demonstrate that cancer detection increased while recall rates decreased after the introduction of breast tomosynthesis combined with full field digital mammography. In addition the positive predictive values for both recalls and biopsies increased.

(AB) Roubidoux M, Lee W, Zeeb L, Nees A, Hadjiiski L, Jeffries D, Chan H, Neal Colleen, Carson P, Melville D. **Role of Ultrasound to Evaluate and Characterize Masses Evident by DBT.** Presented at RSNA 2012, LL-BRS-WE2C Breast Imaging Afternoon CME Posters.  

* Key Point: Sensitivity was high for DBT alone. DBT + US mode decreased false positive biopsy recommendations; DBT + US mode improved accuracy over DBT alone for the less experienced reader, but was not statistically significant. Mean time for characterization of a mass with DBT and US for an experienced reader was about 2 minutes.



(AB) Simon-Yarza I, Viteri G, Garcia-Lallana A, Ibanez I, Elizalde A, Pina L. **The Role of Tomosynthesis after Normal Mammography According to ACR Density Patterns.** Presented at RSNA 2012, LL-BRS-WE1D Breast Imaging Afternoon CME Posters.  

* Key Point: Additional TS in oblique mediolateral view after normal mammograms increases the detection rate from 1.96% to 2.42%. It can be useful not only in dense patterns (3&4), but also in scattered fibroglandular densities (pattern 2).



(P) Skaane P, Gullien R, Bjørndal H, Eben EB, Ekseth U, Haakenaasen U, Jahr G, Jebsen IN, Krager M. **Digital breast tomosynthesis (DBT): initial experience in a clinical setting.** Acta Radiol. 2012 May 16. [Epub ahead of print] PubMed PMID: 22593120.  

* Key Point: The authors conclude that there is the potential for increasing sensitivity using tomosynthesis, especially for cancers manifesting as spiculated masses and distortions.

(P) Timberg P, Bath M, Andersson I, Mattsson S, Tingberg A, Ruschin M. **Visibility of microcalcification clusters and masses in breast tomosynthesis image volumes and digital mammography: A 4AFC human observer study.** Med Phys. 2012 May;39(5): 2431-2437. PubMed PMID: 22559613.

(AB) Wu Y, Munoz Del Rio A, Burnside E. **Quantifying the Performance of Tomosynthesis in the Diagnosis of Breast Cancer.** Presented at RSNA 2012, VSBR41-10 Breast Series: Emerging Technologies in Breast Imaging.  

* Key Point: We find that 2D + 3D provides higher diagnostic value compared with 2D alone. Mutual information analysis can specify the relative value of diagnostic information and is complementary to AUC analysis.



(AB) Zuley M. **Diagnostic Accuracy of Tomosynthesis vs Mammographic Supplemental Views: Impact of Lesion Shape Perception.** Presented at RSNA 2012, SSE02-08 Breast Imaging (Digital Breast Tomosynthesis).  

* Key Point: Tomosynthesis enables improved diagnostic performance for non-calcified lesions in part but not entirely due to improved perception of lesion shape.


2011

Dance DR, Young KC, Van Engen RE. **Estimation of mean glandular dose for breast tomosynthesis: Factors for use with the UK, European and IAEA breast dosimetry protocols.** Phys Med Biol. 2011 Jan 21;56(2):453-71.

D'Orsi CJ, Newell MS. **On the frontline of screening for breast cancer.** Semin Oncol. 2011 Feb;38(1):119-27.



(AB) Gennaro G, Toledano A, Hendrick RE, Paquetel JR, Bezzon E, Di Maggio C, et al. **Lesion Detection and Characterization with Digital Breast Tomosynthesis vs Digital Mammography.** Presented at RSNA 2011, LL-BRS-MO7B Breast Imaging.  

* Key Point: Tomosynthesis reduces the recall rate by improving the detection and characterization of benign lesions.



(P) Gur D, Bandos AI, Rockette HE, Zuley ML, Sumkin JH, Chough DM, Hakim CM. **Localized Detection and Classification of Abnormalities on FFDM and Tomosynthesis Examinations Rated Under an FROC Paradigm.** AJR Am J Roentgenol. 2011 Mar;196(3):737-41. PubMed PMID: 21343521. 

* Key Point: Tomosynthesis plus FFDM could result in better performance





(AB) Gur D, Sumkin J, Zuley M, Anello M, Catullo V, Chough D, Cohen C, Ganott M, Hakim C, Hoffman W, Shah R, Shinde D. Recall Rate Reduction with Tomosynthesis during Baseline Examinations: Preliminary Assessment from a Prospective Screening Trial. Presented at RSNA 2011, MSVB31-08 Breast Series: Emerging Technologies in Breast Imaging.  



* Key Point: Tomosynthesis reduces the recall rate by ~30%

(AB) Iqbal A, Michell M, Wasan R, Douiri A, Evans D, Peacock C, Morel C. An Investigation into the Change of Mammographic Features of Lesions from Full-Field Digital Mammography to Digital Breast Tomosynthesis. Presented at RSNA 2011, SSK01-09 Breast Imaging (Digital Mammography: Present and Advanced).  

* Key Point: Tomosynthesis improves sensitivity, specificity and negative predictive value.

(AB) Martinez P, Pina L, Minguillon C. Digital Breast Tomosynthesis (DBT) and Its Usefulness in the Management of Breast Distortions Detected in Conventional Mammography. Presented at RSNA 2011, LL-BRS-SU2A Breast Imaging.  

* Key point: Tomosynthesis reduces recall rates, unnecessary biopsies and the need for additional projections.

(AB) Michell M, Iqbal A, Wasan R, Douiri A, Evans D, Peacock C, Morel J. Phase II Trial: A Multireader Multicase Study Comparing the Diagnostic Performance of Full-Field Digital Mammography with Digital Breast Tomosynthesis. Presented at RSNA 2011, Session LL-BRS-SU1B Breast Imaging.  



* Key Point: Borderline or no statistical significant difference between diagnostic accuracy of single view tomosynthesis and single view FFDM

(AB) Morel J, Iqbal A, Peacock C, Evans D, Wasan R, Rahim R, Goligher J, Michell M. A comparison of the accuracy of digital breast tomosynthesis with supplementary views in the diagnostic workup of mammographic lesions. Breast Cancer Research 2011, 13(Suppl 1):O6.


* Key Point: Tomosynthesis is comparable or slightly superior to supplementary views when using in patients requiring further diagnostic work-up.

(AB) Mun H, Kim H, Ruppel PL, Kim H, Shin H, Cha J, et al. Assessment of Extent of Breast Cancer: Comparison between Digital Breast Tomosynthesis and Full-field Digital Mammography. Presented at RSNA 2011, SSM01-01 Breast Imaging (Digital and CT).  

* Key point: Tomosynthesis superior to conventional mammography for the evaluation of lesion size overall (small lesions and for lesions in dense breasts). Superiority of tomosynthesis increased with parenchymal density.

(AB) Ngan E, Campbell B, Low G. The Utilization of Spot Compression Views and Average Glandular Dose in a Combined Digital Breast Tomosynthesis and Digital Mammography Clinical Practice. Presented at RSNA 2011, MSVB31-11 Breast Series: Emerging technologies in Breast Imaging.  



* Key Point: The combination of tomosynthesis and conventional mammography did not reduce the utilization of spot compression views by a statistically significant amount.

(P) Noroozian M, Hadjiiski L, Rahnama-Moghadam S, Klein KA, Jeffries DO, Pinsky RW, Chan HP, Carson PL, Helvie MA, Robidoux MA. Digital Breast Tomosynthesis Is Comparable to Mammographic Spot Views for Mass Characterization. Radiology. 2011 Oct 13. 


* Key Point: Tomosynthesis similar to mammographic spot views for mass characterization in terms of visibility ratings, reader performance, and BI-RADS assessment.

(AB) Rafferty E, Niklason L. FFDM vs FFDM with Tomosynthesis for Women with Radiographically Dense Breasts: An Enriched Retrospective Reader Study. Presented at RSNA 2011, MSVB31-10 Breast Series: Emerging Technologies in Breast Imaging.  

* Key Point: Tomosynthesis improves sensitivity and specificity in women with dense breasts

(AB) Skaane P, Gullien R, Eben E, Ekseth U, Haakenaasen U, Jahr G, Jepsen I, Krager M. Reading Time of FFDM and Tomosynthesis in a Population-based Screening Program. Presented at RSNA 2011, MSVB31-07 Breast Series: Emerging Technologies in Breast Imaging.  



* Key Point: Prospective screening trial shows increased cancer detection using tomosynthesis

(P) Spangler ML, Zuley ML, Sumkin JH, Abrams G, Ganott MA, Hakim C, Perrin R, Chough DM, Shah R, Gur D. Detection and classification of calcifications on digital breast tomosynthesis and 2D digital mammography: a comparison. AJR Am J Roentgenol. 2011;196(2):320-324. 

* Key Point: FFDM slightly more sensitive for the detection of calcification than tomosynthesis. However, no significant difference was found in diagnostic performance between the two as measured by area under the curve using BI-RADS.

(P) Tagliafico A, Astengo D, Cavagnetto F, Rosasco R, Rescinito G, Monetti F, Calabrese M. One-to-one comparison between digital spot compression view and digital breast tomosynthesis. Eur Radiol. 2011 Oct 11.  

* Key Point: Tomosynthesis offers an alternative to digital spot compression views (DSCVs) and offers lower mean glandular dose than DSCVs.

(AB) Zuley M, Sumkin J, Ganott M, Bandos A, Kelly A, Lu A, Catullo V, Chough D, Gur D, Perrin R. Digital Breast Tomosynthesis vs Supplemental Diagnostic Mammography Images for the Evaluation of Noncalcified Breast Lesions. Presented at RSNA 2011, MSVB31-06 Breast Series: Emerging Technologies in Breast Imaging.  

* Key Point: Tomosynthesis has comparable sensitivity and specificity to standard diagnostic mammographic views in the classification of non-calcified breast lesions

2010



Bertolini M, Nitrosi A, Borasi G, Botti A, Tassoni D, Sghedoni R, Zuccoli G. Contrast detail phantom comparison on a commercially available unit. Digital breast tomosynthesis (DBT) versus fullfield digital mammography (FFDM). J Digit Imaging. 2011 Feb;24(1):58-65.



Carton AK, Ullberg C, Lindman K, Acciavatti R, Francke T, Maidment AD. Optimization of a dual-energy contrast-enhanced technique for a photon-counting digital breast tomosynthesis system: I. A theoretical model. Med Phys. 2010 Nov;37(11): 5896-907.



Carton AK, Ullberg C, Maidment AD. Optimization of a dualenergy contrast-enhanced technique for a photon-counting digital breast Tomosynthesis system: II. An experimental validation. Med Phys. 2010 Nov;37(11):5908-13.

Chan HP, Wu YT, Sahiner B, Wei J, Helvie MA, Zhang Y, Moore RH, Kopans DB, Hadjiiski L, Way T. Characterization of masses in digital breast tomosynthesis: Comparison of machine learning in projection views and reconstructed slices. Med Phys. 2010 Jul;37(7):3576-86.






(AB) Duple J, Gignier P, Perret B, Balaton A, Hovasse C, Karkouche B. Stereotactic Vacuum Assisted Biopsies on a Digital Breast 3D-Tomosynthesis System Presented at RSNA 2010, Session SSJ01-01 Breast Imaging (Interventional).  

(AB) Dyson S, Iqbal A, Phillips V, Wasan R, Evans D, Peacock C, Morel J, Michell M. Use of digital breast tomosynthesis in pre-operative localization of non-palpable mammographic abnormalities. Poster presented at Symposium Mammographicum Conference 2010, D-P5 Descriptive Poster Abstracts.  

(P) Förnvik D, Zackrisson S, Ljungberg O, Svahn T, Timberg P, Tingberg A, Andersson I. Breast tomosynthesis: Accuracy of tumor measurement compared with digital mammography and ultrasonography. *Acta Radiol.* 2010 Apr;51(3):240-7.  

Gruber R, Riedl CC, Reisseger M, Pinker K, Sturm E, Semturs F, Helbich TH. [Perspectives of the digital mammography platform.] *Radiologe.* 2010 Nov;50(11):999-1007. German.



(P) Gur D, Bandos AI, Rockette HE, Zuley ML, Hakim CM, Chough DM, Ganott MA, Sumkin JH. Is an ROC-type response truly always better than a binary response in observer performance studies? *Acad Radiol.* 2010; 17(5):639-645.  


(P) Hakim CM, Chough DM, Ganott MA, Sumkin JH, Zuley ML, Gur D. Digital breast tomosynthesis in the diagnostic environment: A subjective side-by-side review. *AJR Am J Roentgenol.* 2010 Aug;195(2):W172-6. 



Hellerhoff K. [Digital breast tomosynthesis: Technical principles, current clinical relevance and future perspectives.] *Radiologe.* 2010 Nov;50(11):991-8. German.

(P) Helvie MA, Digital mammography imaging: Breast tomosynthesis and advanced applications. *Radiol Clin North Am.* 2010 Sep;48(5):917-29.  



Holloway CM, Easson A, Escallon J, Leong WL, Quan ML, Reedjik M, Wright FC, McCready DR. Technology as a force for improved diagnosis and treatment of breast disease. *Can J Surg.* 2010 Aug;53(4):268-77.

(AB) Li Y, Ye Z, Wu T. Evaluation of Digital Breast Tomosynthesis on Lesions Assessment and Diagnostic Accuracy: A Preliminary Study on Chinese Patients. Presented at RSNA 2010, Session SSQ01-04 Breast Imaging (Tomosynthesis and Digital Mammography).  



(AB) Meacock L, Mombelloni S, Iqbal A, Akbar N, Wang Y, Michell M. The accuracy of breast cancer size measurement: Digital breast tomosynthesis (DBT) vs 2D digital mammography (DM). Presented at ECR 2010, SS 1702 Staging of breast cancer. 

(AB) Michell M, Iqbal A, Wasan R, Douiri A, Mombelloni S, Meacock L, Evans D, Peacock C, Morel J, MPhil C. A Comparison of the Accuracy of Digital Breast Tomosynthesis with Two Dimension Digital Mammography in Measurement of Breast Tumour Size. Presented at RSNA 2010, Session SSQ01-03 Breast Imaging (Tomosynthesis and Digital Mammography).  

(AB) Michell M, Wasan R, Whelehan P, Iqbal A, Lawinski C, Donaldson ANA, Evans D, Peacock C, Wilson ARM. A comparison of the accuracy of digital mammography (DM) with digital breast tomosynthesis (DBT) and the effect of mammography sign. Presented at ECR 2010.



(AB) Michell M, Wasan R, Iqbal A, Evans D, Peacock C, Morel J, Dyson S, Phillips V, Milnes V. Use of digital breast tomosynthesis in the assessment of mammography detected abnormalities. Poster presented at Symposium Mammographicum Conference 2010, PR-P3 Primary Research Abstracts.  

(AB) Michell M, Wasan R, Iqbal A, Peacock C, Evans D, Morel J. Two-view 2D digital mammography versus one-view digital breast tomosynthesis. *Breast Cancer Research* 2010, 12(Suppl 3):P3 (25 October 2010).

(AB) Michell M, Iqbal A, Wasan R, Douiri A, Evans D, Peacock C, Morel J, Lawinski C. Phase I Trial to Determine the Performance of Digital Breast Tomosynthesis versus Two Dimension Digital and Film-Screen Mammography. Presented at RSNA 2010, SSQ01-02 Breast Imaging (Tomosynthesis and Digital Mammography).  

(AB) Mombelloni S, Iqbal A, Evans D, Wasan R, Morel J, Peacock C, Michell M. Digital Breast Tomosynthesis (DBT): a useful adjunct to two dimensional mammography (2dm) for the preoperative localization of subtle soft tissue lesions. Presented at ECR 2010.



Reiser I, Nishikawa RM. Task-based assessment of breast tomosynthesis: Effect of acquisition parameters and quantum noise. *Med Phys.* 2010 Apr;37(4):1591-600.

(AB) Schafer J, Roubidoux M, Noroozian M, Daly C, Hadjiiski L, Helvie M, Myles J, Chan H, Carson P. Digital Breast Tomosynthesis Compared with Spot Views: Radiologist Preferences. Presented at RSNA 2010, Session SSQ01-05 Breast Imaging (Tomosynthesis and Digital Mammography).  



Semturs F, Sturm E, Gruber R, Helbich TH. [Physical aspects of different tomosynthesis systems.] *Radiologe.* 2010 Nov;50(11):982-90. German.

Shafer CM, Samei E, Lo JY. The quantitative potential for breast tomosynthesis imaging. *Med Phys.* 2010 Mar;37(3):1004-16.

Shaheen, E ; Zanca, F ; Sisini, F ; Zhang, G ; Jacobs, J ; Bosmans, H. Simulation of 3D objects into breast tomosynthesis images. *Radiat Prot Dosimetry.* 2010, Apr,01;139(1-3):108-12.

(P) Svahn T, Andersson I, Chakraborty D, Svensson S, Ikeda D, Förnvik D, Mattsson S, Tingberg A, Zackrisson S. The diagnostic accuracy of dual-view digital mammography, single-view breast tomosynthesis and a dual-view combination of breast tomosynthesis and digital mammography in a freeresponse observer performance study. *Radiat Prot Dosimetry.* 2010 Apr-May;139(1-3):113-7.  

Tingberg A. X-ray tomosynthesis: A review of its use for breast and chest imaging. *Radiat Prot Dosimetry.* 2010 Apr-May;139(1-3):100-7.

(AB) Wasan R, Iqbal A, Evans D, Peacock C, Morel J, Douiri A, Lawinski C, Michell M. Comparing the accuracy of digital breast tomosynthesis with full field digital mammography. Presented at Symposium Mammographicum Conference 2010, 4.3b Proffered Papers.  

(AB) Wasan R, Iqbal A, Evans D, Peacock C, Douiri A, Michell M. An observer performance study comparing the interpretation of full-field digital mammography with digital breast tomosynthesis. *Eur J Cancer.* 2010 Sep 17;8 Suppl 6:O-84.




2009



Bakic PR, Carton AK, Kontos D, Zhang C, Troxel AB, Maidment AD. Breast percent density: Estimation on digital mammograms and central tomosynthesis projections. *Radiology*. 2009 Jul;252(1):40-9. Epub 2009 May 6.


(P) Baldwin P. Digital breast tomosynthesis. *Radiol Technol*. 81(1):57M-74M (2009).  

Carton AK, Gavenonis SC, Currivan JA, Conant EF, Schnall MD, Maidment AD. Dual-energy contrast-enhanced digital breast tomosynthesis--A feasibility study. *Br J Radiol*. 2010 Apr;83(988):344-50. Epub 2009 Jun 8.

(AB) Fornvik D, Sackrisson S, Timberg P, et al. Breast tomosynthesis: Assessment of breast cancer size compared with digital mammography and ultrasonography. Presented at Duke Tomosynthesis Imaging Symposium May 2009.  

Gennaro G, Toledano A, Baldan E, Bezzon E, DiMaggio C, La Grassa, et al. Clinical performance of digital breast tomosynthesis compared to digital mammography: Blinded multireader study. Presented at ECR 2009, Session B-042 New developments on digital systems in breast diagnosis

(P) Gennaro G, Toledano A, di Maggio C, Baldan E, Bezzon E, La Grassa M, Pescarini L, Polico I, Proietti A, Toffoli A, Muzzio PC. Digital breast tomosynthesis versus digital mammography: A clinical performance study. *Eur Radiol*. 2009 Dec 22.  

(P) Gur D, Abrams GS, Chough DM, Ganott MA, Hakim CM, Perrin RL, Rathfon GY, Sumkin JH, Zuley ML, Bandos AI. Digital breast tomosynthesis: Observer performance study. *AJR Am J Roentgenol*. Aug;193 (2):586-91 (2009). 

Helvie M, Chan H, Hadjiiski L, Sahiner B, Casron P, Schmitz A, Digital breast tomosynthesis mammography: Successful assessment of benign and malignant microcalcifications. Presented at RSNA 2009, Scientific Session SSE01-02 Breast Imaging.

Kontos D, Bakic PR, Carton AK, Troxel AB, Conant EF, Maidment AD. Parenchymal texture analysis in digital breast tomosynthesis for breast cancer risk estimation: A preliminary study. *Acad Radiol*. 2009 Mar;16(3):283-98.

Kopans D, Moore R, Digital breast tomosynthesis (DBT) NCI 3000-women trial. Presented at RSNA 2009, Scientific Session SSE01-01 Breast Imaging.

Michell M, Wasan R, Whelehan P, Iqbal A, Lawinski C, Donaldson A, Evans D, Peacock C, Wilson A. Digital breast tomosynthesis: A comparison of the accuracy of digital breast tomosynthesis, two dimensional digital mammography and two-dimensional screening mammography (film-screen). *Breast Cancer Res*. 2009 Oct 26;11 Suppl 2:O1.

Niklason L, Rafferty E, Smith A. Inter-reader variability for the decision to recall and BIRADS characterization: Comparing breast tomosynthesis plus FFDM to FFDM alone. Presented at Duke Tomosynthesis Imaging Symposium May 2009.

Rafferty E, Niklason L. Comparison of FFDM with breast tomosynthesis to FFDM alone: Performance in fatty and dense breasts. Presented at Duke Tomosynthesis Imaging Symposium May 2009.

Rafferty E, Smith A, Niklason L, Assessing radiologist performance in dense versus fatty breasts using combined full-field digital mammography and breast tomosynthesis compared to full-field digital mammography alone. Presented at RSNA 2009, Scientific Session VB31-07 Breast Series: High-Risk Screening.

Rafferty E, Smith A, Niklason L, Comparison of three methods of estimating breast density: BI-RADS density scores using full field digital mammography, BI-RADS density scores using breast tomosynthesis, and volumetric breast density. Presented at RSNA 2009, Scientific Session SSM01-04 Breast Series: High-Risk Screening

Roubidoux M, Rahnama-Moghadam S, Hadjiiski L, Klein K, Jeffries D, Pinsky R, et al, Digital tomosynthesis mammography compared to clinical mammogram spot views. Presented at RSNA 2009, Scientific Session SSE01-03 Breast Imaging.


Saunders RS Jr, Samei E, Lo JY, Baker JA. Can compression be reduced for breast tomosynthesis? Monte Carlo study on mass and microcalcification conspicuity in tomosynthesis. *Radiology*. 2009 Jun;251(3):673-82.



(P) Schulz-Wendtland R, Fuchsjaeger M, Wacker T, Hermann KP. Digital mammography: An update. *Eur J Radiol*. 2009 Jul 8.  

Sechopoulos I, Ghetti C. Optimization of the acquisition geometry in digital tomosynthesis of the breast. *Med Phys*. 2009 Apr;36(4):1199-207.

Sidky EY, Pan X, Reiser IS, Nishikawa RM, Moore RH, Kopans DB. Enhanced imaging of microcalcifications in digital breast tomosynthesis through improved image-reconstruction algorithms. *Med Phys*. 2009 Nov;36(11):4920-32.

Smith A, Rafferty E, Niklason L. Breast tomosynthesis reduces radiologist performance variability compared to digital mammography. Presented at ECR 2009, Session B-043 New developments on digital systems in breast diagnosis.



(P) Taourel P, Merigeaud S, Aubert E, Millet I, Curros Doyon F, Lacroix J, Prat X, Pujol J. [Tomosynthesis: Luxury or necessity?] *J Radiol*. 2009 Dec;90(12):1813-21. French. 

(P) Teertstra HJ, Loo CE, van den Bosch MA, van Tinteren H, Rutgers EJ, Muller SH, Gilhuijs KG. Breast tomosynthesis in clinical practice: Initial results. *Eur Radiol*. 2009 Aug 6.  

Wu G, Mainprize JG, Boone JM, Yaffe MJ. Evaluation of scatter effects on image quality for breast tomosynthesis. *Med Phys*. 2009 Oct;36(10):4425-32.

Zhang Y, Chan HP, Sahiner B, Wei J, Zhou C, Hadjiiski LM. Artifact reduction methods for truncated projections in iterative breast tomosynthesis reconstruction. *J Comput Assist Tomogr*. 2009 May-Jun;33(3):426-35.

Zhao B, Zhou J, Hu YH, Mertelmeier T, Ludwig J, Zhao W. Experimental validation of a three-dimensional linear system model for breast tomosynthesis. *Med Phys*. 2009 Jan;36(1):240-51.

(P) Zuley ML, Bandos AI, Abrams GS, Cohen C, Hakim CM, Sumkin JH, Drescher J, Rockette HE, Gur D. Time to diagnosis and performance levels during repeat interpretations of digital breast tomosynthesis: Preliminary observations. *Acad Radiol*. 2009 Dec 24.  



2008


Chan HP, Wei J, Zhang Y, Helvie MA, Moore RH, Sahiner B, Hadjiiski L, Kopans DB. Computer-aided detection of masses in digital tomosynthesis mammography: Comparison of three approaches. *Med Phys*. 2008 Sep;35(9):4087-95.

Chérel P, Hagay C, Benaim B, De Maulmont C, Engerand S, Langer A, Talma V. [Mammographic evaluation of dense breasts: techniques and limits]. *J Radiol*. 2008 Sep;89(9 Pt 2):1156-68. Review. French.

"Digital breast tomosynthesis" (2008). *Health Devices* 37(7): 207-12.

Funke M, Villena C. [Breast cancer imaging]. *Radiologe*. 2008 un;48(6):601-13; quiz 614. Review. German.

Gennaro G, Toledano A, Baldan E, Bezzon E, DiMaggio C, La Grassa, et al. Inter-reader variability: Tomosynthesis versus digital mammography. Presented at RSNA 2008, Session SSJ01-04 Breast Imaging.

(P) Good WF, Abrams GS, Catullo VJ, Chough DM, Ganott MA, Hakim CM, Gur D. Digital breast tomosynthesis: A pilot observer study. *AJR Am J Roentgenol*. 2008 Apr;190(4):865-9. 

Helvie M, Roubidoux M, Hadjiiski L, Zhang Y, Carson P, Chan HP. Digital breast tomosynthesis mammography: Initial assessment of non-palpable micro calcifications. Presented at RSNA 2008, Session SSJ01-03 Breast Imaging.

Helvie M, Roubidoux M, Hadjiiski L, Zhang Y, Carson P, Chan HP. Research digital tomosynthesis mammography: Detection of T1 invasive breast carcinomas not diagnosed by conventional breast imaging or physical exam. Presented at RSNA 2008, Session SSJ01-06 Breast Imaging.

Kopans D, Moore R, Gavenonis S. Calcification in digital breast tomosynthesis (DBT). Presented at RSNA 2008, Session SSJ01-02 Breast Imaging.

Ma AK, Darambara DG, Stewart A, Gunn S, Bullard E. Mean glandular dose estimation using MCNPX for a digital breast tomosynthesis system with tungsten/aluminum and tungsten/aluminum+silver x-ray anode-filter combinations. *Med Phys*. 2008 Dec;35(12):5278-89.

(P) Nees AV. Digital mammography: Are there advantages in screening for breast cancer? *Acad Radiol*. 2008 Apr;15(4):401-7.  

Reiser I, Nishikawa RM, Edwards AV, Kopans DB, Schmidt RA, Papaioannou J, Moore RH. Automated detection of microcalcification clusters for digital breast tomosynthesis using projection data only: A preliminary study. *Med Phys*. 2008 Apr;35(4):1486-93.

Schulz-Wendtland R, Hermann KP, Wacker T, Bautz W. [Current situation and future perspectives of digital mammography]. *Radiologe*. 2008 Apr;48(4):324-34. Review. German.

Singh V, Saunders C, Wylie L, Bourke A. New diagnostic techniques for breast cancer detection. *Future Oncol*. 2008 Aug;4(4):501-13. Review.

Singh S, Tourassi GD, Baker JA, Samei E, Lo JY. Automated breast mass detection in 3D reconstructed tomosynthesis volumes: A featureless approach. *Med Phys*. 2008 Aug;35(8):3626-36.

Timberg, P, Båth, M, Andersson, I, Svahn, T, Ruschin, M, Hemdal, B, Mattsson, S, Tingberg, A, Impact of dose on observer performance in breast tomosynthesis using breast specimens. *Medical Imaging 2008:*

Physics of Medical Imaging. Proceedings of the SPIE, Volume 6913, pp. 69134J-69134J-10.


Zhao B, Zhao W. Imaging performance of an amorphous selenium digital mammography detector in a breast tomosynthesis system. *Med Phys*. 2008 May;35(5):1978-87.



Zhao B, Zhao W. Three-dimensional linear system analysis for breast tomosynthesis. *Med Phys*. 2008 Dec;35(12):5219-32.

2007

Diekmann F, Meyer H, Diekmann S, Puong S, Muller S, Bick U, Rogalla P. Thick slices from tomosynthesis data sets: Phantom study for the evaluation of different algorithms. *J Digit Imaging*. 2009 Oct;22(5):519-26. Epub 2007 Oct 23.


Diekmann F, Bick U. Tomosynthesis and contrast-enhanced digital mammography: Recent advances in digital mammography. *Eur Radiol*. 2007 Dec;17(12):3086-92. Epub 2007 Jul 28.



(P) Gur D. Tomosynthesis: Potential clinical role in breast imaging. *AJR Am J Roentgenol*. 2007 Sep;189(3):614-5. 

(P) Lewin JM, Niklason L. Advanced applications of digital mammography: Tomosynthesis and contrast-enhanced digital mammography. *Semin Roentgenol*. 2007 Oct;42(4):243-52.  


Nishikawa, RM, Reiser I, Seifi P, Vyborny CJ, A new approach to digital breast tomosynthesis for breast cancer screening (Proceedings Paper). *Medical Imaging 2007: Physics of Medical Imaging*, Jiang Hsieh; Michael J. Flynn, Editors, 65103C. Date: 15 March 2007.

(P) Park JM, Franken EA Jr, Garg M, Fajardo LL, Niklason LT. Breast tomosynthesis: Present considerations and future applications. *Radiographics*. 2007 Oct;27 Suppl 1:S231-40. 

(P) Poplack SP, Tosteson TD, Kogel CA, Nagy HM. Digital breast tomosynthesis: Initial experience in 98 women with abnormal digital screening mammography. *AJR Am J Roentgenol*. 2007 Sep;189(3):616-23. 

(P) Rafferty EA. Digital mammography: Novel applications. *Radiol Clin North Am*. 2007 Sep;45(5):831-43, vii.  

Rafferty EA, Niklason L, Halpern E et al. Assessing radiologist performance using combined full-field digital mammography and breast tomosynthesis versus full-field digital mammography alone: results of a multi-center, multi-reader trial. Presented at RSNA 2007, Session SSE26-02 Late breaking multicenter clinical trials.

(P) Van Ongeval Ch. Digital mammography for screening and diagnosis of breast cancer: An overview. *JBR-BTR*. 2007 May-Jun;90(3):163-6. 

Zhang Y, Chan HP, Sahiner B, Wu YT, Zhou C, Ge J, Wei J, Hadjiiski LM. Application of boundary detection information in breast tomosynthesis reconstruction. *Med Phys*. 2007 Sep;34(9):3603-13.

Zhou J, Zhao B, Zhao W. A computer simulation platform for the optimization of a breast tomosynthesis system. *Med Phys*. 2007 Mar;34(3):1098-109.



2006

Brusin JH. Digital Mammography: An update. *Radiol Technol*. 2006 January-February;77(3):226M-234M.

Mainprize JG, Bloomquist AK, Kempston MP, Yaffe MJ. Resolution at oblique incidence angles of a flat panel imager for breast tomosynthesis. *Med Phys*. 2006 Sep;33(9):3159-64.

Rafferty EA, Niklason L, Jameson LA. Breast tomosynthesis: One view or two? Presented at RSNA 2006, Session SSG01-04 Breast Imaging.

Reiser I, Nishikawa RM, Giger ML, Wu T, Rafferty EA, Moore R, Kopans DB. Computerized mass detection for digital breast tomosynthesis directly from the projection images. *Med Phys*. 2006 Feb;33(2):482-91.

Schulz-Wendtland R, Wenkel E, Lell M, Böhner C, Bautz WA, Mertelmeier T. Experimental phantom lesion detectability study using a digital breast tomosynthesis prototype system. *Rofo*. 2006 Dec;178(12):1219-23.

Wu T, Moore RH, Kopans DB. Voting strategy for artifact reduction in digital breast tomosynthesis. *Med Phys*. 2006 Jul;33(7):2461-71.

2005

Chan HP, Wei J, Sahiner B, Rafferty EA, Wu T, Roubidoux MA, Moore RH, Kopans DB, Hadjiiski LM, Helvie MA. Computeraided detection system for breast masses on digital tomosynthesis mammograms: Preliminary experience. *Radiology*. 2005 Dec;237(3):1075-80. Epub 2005 Oct 19.

Reddy DH, Mendelson EB. Incorporating new imaging models in breast cancer management. *Curr Treat Options Oncol*. 2005 Mar;6(2):135-45. Review.

Smith A. Full-field breast tomosynthesis. *Radiol Manage*. 2005 Sep-Oct;27(5):25-31.

2004

Smith AP, Hall PA, Marcello DM. Emerging technologies in breast cancer detection. *Radiol Manage*. 2004 Jul-Aug;26(4):16-24; quiz 25-7.

Wu T, Moore RH, Rafferty EA, Kopans DB. A comparison of reconstruction algorithms for breast tomosynthesis. *Med Phys*. 2004 Sep;31(9):2636-47.


2000

Suryanarayanan S, Karellas A, Vedantham S, Glick SJ, D'Orsi CJ, Baker SP, Webber RL. Comparison of tomosynthesis methods used with digital mammography. *Acad Radiol*. 2000 Dec;7(12):1085-97.

1998

Niklason LT, Kopans DB, Hamberg LM. Digital breast imaging: Tomosynthesis and digital subtraction mammography. *Breast Dis*. 1998 Aug;10(3-4):151-64.

1997

(P) Niklason LT, Christian BT, Niklason LE, Kopans DB, Castleberry DE, Opsahl-Ong BH, Landberg CE, Slanetz PJ, Giardino AA, Moore R, Albagli D, DeJule MC, Fitzgerald PE, Fobare DE, Giambattista BW, Kwasnick RF, Liu J, Lubowski SJ, Possin GE, Richotte JF, Wei CY, Wirth RF. Digital tomosynthesis in breast imaging. *Radiology*. 1997 Nov;205(2):399-406. 





**United States/
Latin America**
35 Crosby Drive
Bedford, MA 01730-1401
USA

Hologic UK Limited
Unit 2, Link 10,
Napier Way, Crawley,
West Sussex, RH10 9RA
United Kingdom

Hologic Asia Pacific
7th Floor, Biotech Centre 2
No. 11 Science Park West Avenue
Hong Kong Science Park
Shatin, New Territories
Hong Kong

Hologic Belgium
Everest (Cross Point)
Leuvensesteenweg 250A
1800 Vilvoorde
Belgium

Hologic Australia
Hologic (Australia) Pty Ltd
Suite 402, Level 4
2 Lyon Park Road
Macquarie Park NSW 2113
Australia

Hologic China
Hologic Healthcome
Room 1606, Building A,
Feng Lan Guo Ji Center
32 Xi Zhi Men Bei Da Jie
Haidian District, Beijing, (100082)
China

